Attorney Docket No.: 06975/029WO1

DATA LOCALIZATION

BACKGROUND

Data service providers can use centralized host computer systems to provide customized information service data to users at remote client computers. The information service data may be localized. That is, the host computer may send data to a user at a remote client computer that is specific to a particular geographic or logical location. For example, a host computer can provide localized weather service data to users at client computers throughout a country. To localize the weather data, the host system can select different weather data depending on the geographic location of the client computer. Data localization techniques may require that a user identify the location of interest. For example, a user may be prompted to enter address, phone number, zip code or other location identification data needed by a host system to localize data for the particular user.

SUMMARY

Localization of information service data provided by an information service host computer system to users at remote client computer systems can be facilitated by automatically determining a geographic or logical location associated with the client computer system. The automatic determination of a location can be achieved using data identifying the terminal server through which a client computer accesses the host system or computer network.

In general, in one aspect, the invention features a data transfer method. The method includes receiving terminal server identification data at a host system from a terminal server, querying a database to obtain localized information service data associated with the terminal server identification data, and sending the localized information service data from the host system to the terminal server.

In general, in another aspect, the invention features a computer host system. The host system includes a database system, a network interface, and a processor. The database system

includes records to associate terminal server identification data with information service data. The interface couples the host system to a communications link over which the host system can exchange data with a terminal server. The processor is coupled to the interface and to the database and is configured to receive terminal server identification data from the data interface, to query the database for localized information service data associated with the terminal server identification data, and to send the localized information service data obtained by the query to the data interface for transmission to the terminal server.

In general, in another aspect, the invention features a computer program residing on a computer-readable medium. The program includes instructions for causing a computer to receive terminal server identification data from a terminal server, to query a database to obtain localized information service data associated with the terminal server identification data, and to send the localized information service data from the host system to the terminal server.

Implementations may include one or more of the following features. A host system database may include records associating terminal server identification data with location data and/or directly associating the identification data with localized information service data. Data connections may be established between a client computer and the terminal server and between the terminal server and a host computer system. The host system may include packet processing circuitry to receive data packets from the terminal server, and to extract terminal server identification data from a header region of the data packet. For example, the host may extract the terminal server's network address from a data packet and is it as the terminal server identifier. The host may query a database based on the terminal server identification data to determine localized information to be sent to the client computer. Localization of particular data services may be done in response to a request originating at a client computer identifying a specific information service. In such a case, the host may obtain localized information service data using a database query based on both the terminal server identification data and the specified information service.

The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Implementations may provide advantages such as facilitating access to localized data without requiring user location input. Other features, objects, and advantages of the invention will be apparent from the description and drawings, and from the claims.

software, scientific software, internet access software, word processing software, and many other types of software. User applications may access computer system peripherals 112-114, 121, and 124 through an application programming interface provided by the operating system and/or may directly interact with underlying computer system 100 hardware.

A collection of computers 100 can serve as components of a computer network. As shown in Fig. 2, a computer network 200 can include a host computer system 210 and client computers 231-236. The client computers 231-236 can communicate with the host 210 to obtain data stored at the host 210 in databases 214-215. The client computer 231-236 may interact with the host computer 210 as if the host was a single entity in the network 200. However, the host 210 may include multiple processing and database sub-systems that can be geographically dispersed throughout the network 200. For example, a host 210 may include a tightly coupled cluster 21 I-213 of computers 100 (Fig. 1) at a first location that access database systems 2 14-2 15 at remote locations. Each database system 2 14-2 15 may include additional processing components.

Client computers 231-236 can communicate with the host system 210 over, for example, a combination of public switched telephone network dial-up connections and packet network interconnections. For example, client computers 23 1-233 may each include a modem coupled to voiceband telephone line 241-243. To communicate with the host 210, the client computers 231-233 establish a data connection with a local terminal server 225 by dialing a telephone number assigned to the local terminal server 225. A local terminal server 225 may have both dial-up and packet network interfaces allowing the server 225 to receive data from client computers 23 1-233, segment the received data into data packet payload segments, add overhead information to the payload segments, and send the resultant data packets over a link 221 to a packet data network 220 for delivery to the host system 210. Terminal servers 225 and 226 may also be referred to as a network service provider's point-of-presence (POP).

The overhead information added to the payload segments includes a packet header. A packet header includes a destination address assigned to the host system 210 and a source address assigned to the local terminal server 225. Other overhead information may include information associating the data packet with a specific client 231-233. Similarly, the host system 210 may send data to a client 231-233 by segmenting the data internet packet payload segments, and adding overhead information to send the data packet to a client 231-234 at the terminal server 225. Client computers 234-236 may similarly exchange data with the host 210 over communications links 244-246 to the terminal server 226.

integrated circuits).

A number of embodiments of the present invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. For example, the terminal server is not limited to a modem bank. A terminal server may be a proxy server, network gateway, network firewall, or other network element through which client computers connect to a host system and which allow a location to be associated with a client.